

The Health Belief Model: The Healthy Eating Habits Among 11th-grade High School Students in Health Sciences Cluster

Akira Yumna Ramadhani¹, Citra Nurani Putri¹, Nurita Andayani^{2*}

¹Budi Cendekia Islamic High School

²Faculty of Pharmacy, Universitas Pancasila, South Jakarta, DKI Jakarta, Indonesia.

*Corresponding Author: nurita.andayani@univpancasila.ac.id

Received: 18 June 2026 / Accepted: 30 June 2026

ABSTRACT: Adolescents are vulnerable to unhealthy eating habits due to increased independence in choosing food and strong peer influence. This study aimed to determine the level of Health Belief Model (HBM) related to eating habits among 11th-grade high school students in the health cluster. This study used a descriptive quantitative method with prospective data collection through a questionnaire. The study population was all 11th grade students in the health cluster at Budi Cendekia Islamic High School. The study sample consisted of 42 respondents using a purposive sampling technique. The results showed that the overall HBM scores revealed that 54.8% of the students possessed a high level, and 45.2% fell into the moderate category, with zero instances of low HBM. The component with the highest HBM score was perceived benefits, with 88.1% included in the "High" category; self-efficacy had the largest proportion in the "Medium" category at 64.3%; and perceived barriers had the highest proportion in the "Low" category at 19.0%. The HBM level was mostly in the "High" category at 54.8%. However, the fact that the self-efficacy and cues to action components remained in the "Moderate" category indicates a gap between beliefs and actual eating behavior.

KEYWORDS: *Health Belief Model (HBM)*; eating habits, adolescent; sex; pocket money.

1. INTRODUCTION

Adolescents are an age group that is highly vulnerable to unhealthy eating habits due to their increasing independence in food choices and the strong influence of peers [1]. In Indonesia, this situation is exacerbated by the burden of malnutrition; Riskesdas [2] reported a prevalence of underweight among adolescents aged 13–15 years of 8.7%, while the prevalence of overweight and obesity reached 16.0%. Rachmi et al. [3], in a systematic review, concluded that the dietary patterns of Indonesian adolescents are dominated by fast food and ultra-processed foods, with fruit and vegetable intake far below recommended levels.

The Health Belief Model (HBM) is the most widely used theoretical framework for health behavior to understand and predict adolescents' eating behaviors. Developed by Rosenstock [4] and refined with the addition of the self-efficacy construct, the HBM explains that an individual will take health promoting actions if they perceive themselves as vulnerable to a disease, consider that disease to be serious, believes the benefits of the action outweigh the barriers, receives cues to act, and possesses sufficient self-efficacy [5]. This model consists of six main components perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy which work synergistically; thus, a weakness in any one component can hinder the realization of healthy behavior as a whole [6].

The HBM level describes how strongly an individual's overall health perceptions drive health-related actions, including healthy eating habits. A study by Saghafi-Asl et al. [7] on female college students in Iran demonstrated that the higher the HBM level, the more likely an individual is to consistently adopt healthy eating behaviors. In Indonesia, Kisda et al. [8] found that adolescents with moderate HBM levels tend to have good knowledge and intentions but are not yet able to translate these into eating behaviors, as low self-efficacy is the primary barrier to tangible behavioral change.

The eating habits of high school-aged adolescents are influenced by environmental, social, and economic factors. Widiyanto et al. [9] found that although Indonesian adolescents' nutritional awareness is quite good,

How to cite this article: Ramadhani AY, Putri CN, Andayani N. The Health Belief Model: The Healthy Eating Habits Among 11th-grade High School Students in Health Sciences Cluster. *IjaclinPharm*. 2026; 3(1): 20-25.

their actual eating habits still tend to be unhealthy due to high perceived barriers and easy access to unhealthy foods around schools. Kisda et al. [8] added that prior to receiving a nutrition intervention, the majority of high school students had poor dietary quality due to low self-efficacy and a lack of environmental cues to action within the school setting. This situation underscores that schools play a strategic role one that has not yet been fully optimized in shaping adolescents' eating habits. Based on this background, this study aimed to determine the level of health belief model (HBM) regarding eating habits among 11th-grade High School Students in Health Sciences Cluster at Budi Cendekia Islamic School.

2. MATERIALS AND METHODS

2.1. Material

Research used a descriptive quantitative design conducted at Budi Cendekia Islamic School in May 2026. The population consisted of health cluster students in classes XI A1 and XI A2, with a sample of 42 respondents (XI A1: 24 students, XI A2: 18 students) selected using purposive sampling. Inclusion criteria included being actively enrolled in class XI A and being willing to complete the questionnaire in full.

2.2. Procedure

The research instrument consisted of a structured questionnaire using a 1–5 Likert scale (1 = Disagree, 2 = Somewhat Disagree, 3 = Neutral, 4 = Somewhat Agree, 5 = Agree). The questionnaire was developed based on the six components of the Health Belief Model (HBM), comprising a total of 20 items: perceived susceptibility (3 items), perceived severity (3 items), perceived benefits (3 items), perceived barriers (4 items), cues to action (4 items), and self-efficacy (3 items). The number of items in each component was adjusted according to the complexity of the construct, with perceived barriers and cues to action requiring more items due to their multidimensional nature and inclusion of both internal and external factors [6].

Data were analyzed using descriptive statistics by calculating the frequency and percentage for each category. Levels of perceived susceptibility, perceived severity, perceived benefits, and self-efficacy were categorized as Low (scores 3–6), Moderate (scores 7–11), and High (scores 12–15). Levels of perceived barriers and cues to action were categorized as Low (4–8), Moderate (9–14), and High (15–20). The Health Belief Model (HBM) level was determined by dividing the total score of the HBM components and categorizing the results as Low HBM (scores 20–46), Moderate HBM (scores 47–73), and High HBM (scores 74–100).

3. RESULTS

This section presents the empirical findings regarding the healthy eating habits of 11th-grade high school students within the health sciences cluster, analyzed through the lens of the Health Belief Model (HBM). A total of 42 students participated in this study. To provide a contextual baseline for the findings, the demographic profile of the participants is summarized in Table 1.

Table 1. Students characteristics.

Variable	All (N=42)	Health Belief Model		
		Low	Moderate	High
Sex				
Male	10(23.8)	0(0.0)	6(60.0)	4(40.0)
Female	32(76.2)	0(0.0)	13(31.3)	19(68.67)
Average Daily Pocket Money per day				
≤ IDR 10.000	1(2.4)	0(0.0)	1(100.0)	0(0.0)
IDR 10.000 - 20.000	8(19.1)	0(0.0)	4(50.0)	4(50.0)
IDR 20.001 - 30.000	14(33.3)	0(0.0)	5(35.7)	9(64.3)
> IDR 30.000	19(45.2)	0(0.0)	9(47.4)	10(52.6)
Number of Siblings				
0	5(11.9)	0(0.0)	2(40.0)	3(60.0)
1	11(26.2)	0(0.0)	6(54.5)	5(45.5)
>2	26(61.9)	0(0.0)	11(42.3)	15(57.7)
How often do you have breakfast?				
Never	0(0.0)	0(0.0)	0(0.0)	0(0.0)

Variable	All (N=42)	Health Belief Model		
		Low	Moderate	High
Rarely	4(9.5)	0(0.0)	3(75.0)	1(25.0)
Sometimes	11(26.2)	0(0.0)	7(63.6)	4(36.4)
Often	12(28.6)	0(0.0)	5(41.7)	7(58.3)
Always	15(35.7)	0(0.0)	4(26.7)	11(73.3)
How often do you eat vegetables and fruit?				
Never	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Rarely	2(4.8)	0(0.0)	0(0.0)	2(100.0)
Sometimes	18(42.9)	0(0.0)	9(50.0)	9(50.0)
Often	13(31.0)	0(0.0)	7(53.8)	6(46.2)
Always	9(21.4)	0(0.0)	3(33.3)	6(66.7)
How often do you consume fast food?				
Never	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Rarely	7(16.7)	0(0.0)	5(71.4)	2(28.6)
Sometimes	11(26.2)	0(0.0)	6(54.5)	5(45.5)
Often	22(52.4)	0(0.0)	8(36.4)	14(63.6)
Always	2(4.8)	0(0.0)	0(0.0)	2(100.0)

Table 1 presents the distribution of respondents' demographic characteristics and dietary habits according to Health Belief Model (HBM) categories. The study sample of 42 participants was predominantly female (76.2%), with males making up the remaining 23.8%. Most female respondents demonstrated a high level of health beliefs (68.7%), while among males, 60.0% were classified as having a moderate level of health beliefs and 40.0% as having a high level. None of the respondents were categorized as having a low level of health beliefs. Regarding daily pocket money, the largest proportion of respondents reported receiving more than IDR 30,000 per day (45.2%), followed by IDR 20,001–30,000 (33.3%), IDR 10,001–20,000 (19.1%), and ≤ IDR 10,000 (2.4%). Across all allowance categories, respondents were predominantly classified into the moderate and high HBM groups. Notably, participants receiving more than IDR 30,000 per day were slightly more likely to exhibit high health beliefs (52.6%) than moderate health beliefs (47.4%). With respect to family characteristics, most respondents had more than two siblings (61.9%), followed by one sibling (26.2%) and no siblings (11.9%). Similar to the other demographic variables, respondents in each sibling category were primarily classified into the moderate and high HBM groups. Among participants with more than two siblings, 57.7% demonstrated high health beliefs, whereas 42.3% were categorized as having moderate health beliefs. Breakfast consumption was generally frequent among the respondents. More than one-third of participants reported always eating breakfast (35.7%), while 28.6% reported often eating breakfast and 26.2% reported sometimes eating breakfast. Only 9.5% reported rarely eating breakfast, and none reported never eating breakfast. Respondents who always consumed breakfast were predominantly classified into the high HBM category (73.3%), whereas those who reported sometimes eating breakfast were more frequently classified into the moderate HBM category (63.6%).

A similar pattern was observed for fruit and vegetable consumption. The largest proportion of respondents reported consuming fruits and vegetables sometimes (42.9%), followed by often (31.0%) and always (21.4%). Only 4.8% reported rarely consuming fruits and vegetables, while none indicated never consuming them. Participants who often consumed fruits and vegetables were almost equally distributed between the moderate (53.8%) and high (46.2%) HBM categories, whereas those who always consumed fruits and vegetables were more frequently classified into the high HBM group (66.7%). Regarding fast-food consumption, more than half of the respondents reported often consuming fast food (52.4%), followed by sometimes (26.2%), rarely (16.7%), and always (4.8%), while no respondents reported never consuming fast food. Among respondents who reported often consuming fast food, 63.6% were classified as having high health beliefs and 36.4% as having moderate health beliefs. In contrast, respondents who rarely consumed fast food were predominantly categorized into the moderate HBM group (71.4%).

Table 2. Levels of HBM Components.

HBM Components (N=42)	Low n(%)	Moderate n(%)	High n(%)
Perception of	0(0.0)	12(28.6)	30(71.4)

HBM Components (N=42)	Low n(%)	Moderate n(%)	High n(%)
Vulnerability			
Perceived Severity	0(0.0)	10(23.8)	32(76.2)
Perceived Benefits	0(0.0)	5(11.9)	37(88.1)
Perceived Barriers	8(19.0)	26(61.9)	8(19.0)
Cues to Act	2(4.8)	25(59.5)	15(35.7)
Self-Efficacy	5(11.9)	27(64.3)	10(23.8)

Table 2 shows the distribution of the HBM levels, where the components of perceived vulnerability, perceived severity, and perceived benefits tend to be dominated by high levels (percentages above 50%). Meanwhile, the components of perceived barriers, cues to act, and self-efficacy are dominated by moderate levels (percentages above 50%). Students' perceived susceptibility and perceived severity scores were predominantly in the "High" category, at 71.4% and 76.2%, respectively, reflecting students' good understanding of the risks and impacts of unhealthy eating patterns. Alyafei et al. [6] explain that individuals who understand their vulnerability and the seriousness of health threats tend to be more motivated to take preventive actions. Thus, the high levels of these two components serve as a positive cognitive foundation for the development of healthy eating behaviors, although it must be accompanied by reinforcement of other components to translate into concrete actions. Perceived benefits recorded the highest percentage in the "High" category at 88%, but perceived barriers remained in the moderate (61.2%) and low (19%) categories. In the Health Belief Model (HBM), perceived benefits must outweigh perceived barriers for an individual to actually act; thus, remaining barriers can weaken the link between intention and actual behavior [6]. This aligns with Jones et al. [5], who refer to this as the "intention-behavior gap." Kisda et al. [8] also found that HBM-based interventions are more effective at increasing knowledge and attitudes than at directly changing eating behavior, particularly regarding the components of perceived barriers and cues to action.

The "cues to action" and "self-efficacy" components were both predominantly in the "Moderate" category 59.5% and 64.3%, respectively indicating that environmental incentives and students' self-confidence in practicing healthy eating habits are not yet optimal. Efthymiou et al. [10] found that self-efficacy is the most important component and also the easiest to modify through structured, multi component school-based intervention programs. Periodic increases in self-efficacy among adolescents have been shown to result in better and more sustainable changes in eating behavior.

Table 3. The HBM Levels.

HBM Levels (N=42)	n(%)
Low	0(0.0)
Moderate	19(45.2)
High	23(54.8)

Table 3 shows the overall distribution of HBM levels, indicating that 54.8% of students have a high HBM level. The moderate HBM level accounts for 45.2%, and no students have a low HBM level, indicating that all students in Class XI A already possess adequate health beliefs.

4. DISCUSSION

The findings of this study provide crucial insights into the health beliefs and eating habits of 11th-grade students within the health sciences cluster. The overall HBM scores revealed that 54.8% of the students possessed a high level of health beliefs, and 45.2% fell into the moderate category, with zero instances of low HBM (Table 3). This overall positive trend is likely highly influenced by the participants' academic track. Students enrolled in a health sciences cluster are exposed to a curriculum that integrates health literacy, human biology, and disease prevention, which inherently solidifies their cognitive framework regarding health-seeking behaviors [11]. However, a profound paradox emerged when comparing the cognitive components of HBM with actual dietary practices. Table 2 demonstrated that the students possessed exceptionally high perceived benefits (88.1%), perceived severity (76.2%), and perceived vulnerability (71.4%). This implies that the students are acutely aware of their susceptibility to nutritional diseases, understand the severity of health complications, and recognize the immense benefits of healthy eating. Despite this high baseline awareness, more than half of the students (52.4%) consumed fast food "often," and only 21.4% "always" ate fruits and vegetables (Table 1). This gap between high-risk perception and poor behavioral execution can be explained by the moderate levels of self-efficacy (64.3%) and moderate perceived barriers (61.9%) documented in Table

2. Although perceived susceptibility and perceived severity may increase awareness of disease risk, these constructs alone are insufficient to induce behavioral change. Recent behavioral theories emphasize that self-efficacy, together with the ability to overcome environmental barriers, plays a pivotal role in translating health beliefs into actual health behaviors [12]. Alyafei & Easton-Carr [6] explain that individuals who understand their vulnerability and the seriousness of health threats tend to be more motivated to take preventive actions. Thus, the high levels of these two components serve as a positive cognitive foundation for the development of healthy eating behaviors, although it must be accompanied by reinforcement of other components to translate into concrete actions. The environmental incentives and students' self-confidence in practicing healthy eating habits are not yet optimal. Efthymiou et al. [10] found that self-efficacy is the most important component and also the easiest to modify through structured, multi-component school-based intervention programs. Periodic increases in self-efficacy among adolescents have been shown to result in better and more sustainable changes in eating behavior.

Adolescents consider cost, convenience, and choice to be key factors influencing preferences for food outlets and foods. While quality, variety, and healthfulness are also important factors in food choices, these features, particularly those related to affordable, healthy food, are perceived as difficult to find. Social factors such as spending time with friends are also important features of the food environment that deserve further attention. Adolescents' perceptions of their food environment provide insights into features that can be manipulated to enable healthy choices [13]. This environmental pressure undermines their self-efficacy, making it easier to succumb to fast-food consumption despite knowing its long-term adverse effects. Furthermore, economic factors play a vital role in dictating adolescent dietary choices. In this study, 45.2% of the students received a substantial daily allowance of over IDR 30,000 (Table 1). In a developing urban context, higher pocket money among adolescents is positively correlated with higher frequency of fast food consumption [14]. Wealthier students have the financial autonomy to purchase commercial fast food during or after school hours, transforming disposable income into a structural barrier to healthy eating. Gender dynamics also influenced health belief distributions, with 68.67% of female students displaying high overall HBM scores compared to only 40.0% of males (Table 1). This aligns with global adolescent health literature showing that female adolescents generally display higher health consciousness, place greater emphasis on dietary aesthetics and wellness, and are more receptive to health-promotional frameworks than males [15]. Consequently, interventions designed for high schools must go beyond increasing health awareness which is already high due to their health science background and instead focus on building practical self-efficacy, modifying the school food environment, and targeting male students who display lower health beliefs.

In the Health Belief Model (HBM), perceived benefits must outweigh perceived barriers for an individual to actually act; thus, remaining barriers can weaken the link between intention and actual behavior [6]. This aligns with Jones et al. [5], who refer to this as the "intention-behavior gap." Kisda et al. [8] also found that HBM based interventions are more effective at increasing knowledge and attitudes than at directly changing eating behavior, particularly regarding the components of perceived barriers and cues to action. Saghaei-Asl et al. [7] emphasize that the higher a person's HBM level, the greater their likelihood of consistently adopting healthier eating behaviors, as the components of perceived severity, perceived barriers, and self-efficacy significantly predict actual eating behaviors. Nevertheless, the high overall HBM scores still need to be accompanied by strengthening of the components that remain weak so that they are truly reflected in daily eating habits.

5. CONCLUSION

This study demonstrates that 11th-grade high school students within the health sciences cluster possess a robust cognitive foundation regarding nutrition, with the entirety of the cohort exhibiting high (54.8%) to moderate (45.2%) overall Health Belief Model (HBM) levels. The students display exceptionally high-risk perceptions (perceived vulnerability and severity) and a strong appreciation for the benefits of a healthy diet. However, a distinct knowledge and behavior paradox persists, despite this elevated health awareness, poor dietary habits such as frequent fast-food consumption, and suboptimal intake of fruits and vegetables remain highly prevalent. The findings reveal that this gap between cognitive belief and behavioral execution is primarily driven by moderate levels of self-efficacy and the presence of external barriers, which are further compounded by higher socioeconomic autonomy (daily pocket money) and gender-based differences, where male students exhibit lower health beliefs than their female peers.

Acknowledgements:

Author contributions: Concept – AYR, CNP, NA; Design – NA; Supervision – CNP; Resources – AYR, CNP, NA; Materials – AYR; Data Collection and/or Processing – AYR, NA; Analysis and/or Interpretation – AYR, CNP, NA; Literature Search – AYR, CNP, NA; Writing – NA.; Critical Reviews – AYR, CNP, NA.

Conflict of interest statement: The authors declared no conflict of interest in the manuscript.

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